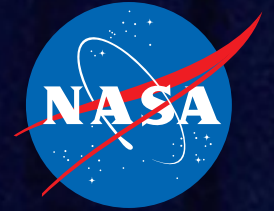


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George Takei of “Star Trek” Beams Down to Goddard

By Robert Garner

As helmsman of the starship *Enterprise*, Lt. Hikaru Sulu explored strange, new worlds, sought out new life and new civilizations, and boldly went where no one had gone before. On June 3, however, Lt. Sulu’s course did not take him to Vulcan or to a rendezvous with the Klingons.

Instead, George Takei—famous for portraying Sulu on “Star Trek”—visited NASA’s Goddard Space Flight Center to deliver a presentation entitled “Leadership, Diversity, and Harmony: Gateway to Success.” Takei’s lecture linked the diversity displayed in the original “Star Trek” series, which aired from 1966 to 1969, to the diversity he encountered at Goddard.

“Gene Roddenberry, the creator of ‘Star Trek,’ frequently reminded us that the starship *Enterprise* was a metaphor for starship Earth, and the strength of this starship lay in its diversity,” Takei said. “I see [at NASA] the same diversity that we had on ‘Star Trek.’”

Aside from the Japanese-American helmsman, the *Enterprise* bridge crew included Lt. Uhura, of African heritage, and Mr. Chekov, of Russian descent. Takei reminded a full auditorium that the racial climate and Cold War tensions of the 1960s made the *Enterprise* crew a “political fiction.” Today, however, the International Space Station (ISS) is just one example of how far society has come since then. Takei said that the cooperation shown on the ISS, “was a utopian dream four short decades ago.”



Photo credit: Bill Hrybyk

Caption: George Takei describes his experiences as a child in a Japanese-American internment camp during World War II.

Takei attributed this progress to people he called “change agents.” “Change agents can envision a world better than the one we have today and act to make it better,” he said, adding that he sees a lot of change agents at Goddard, both social and technological. “You folks are the real pioneers of our time.”

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Cover caption: George Takei salutes the “Star Trek” fans in the audience after answering several questions about his presentation. The plaque in his left hand was a gift from Goddard’s Gay, Lesbian, Bisexual, and Transgender Advisory Commission and the Asian Pacific American Advisory Commission.

Photo Credit: Bill Hrybyk.

GoddardView Info

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Managing Editor: Trusilla Steele

Editor: John Putman

Deadlines: News items and brief announcements for publication in the Goddard View must be received by noon of the 1st and 3rd Wednesday of the month. You may submit contributions to the editor via e-mail at john.m.putman@nasa.gov. Ideas for new stories are welcome but will be published as space allows. All submissions are subject to editing.

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George Takei of “Star Trek” Beams Down to Goddard

Continued from Page 2

Takei also spoke of his own experiences with discrimination. The Japanese-American was born in Los Angeles in 1937. After the bombing of Pearl Harbor in 1941 that brought the United States into World War II, President Roosevelt signed an executive order that forced Japanese-Americans into internment camps across the country. Takei and his family spent the rest of the war in one of these detention facilities.

Goddard's Gay, Lesbian, Bisexual, and Transgender Advisory Council and the Asian Pacific American Advisory Committee partnered to invite Takei. The timing of his visit coincided with the end of Asian Pacific American Heritage Month (May) and the start of Gay and Lesbian Pride Month (June).

Prior to the lecture, Takei and his partner toured Goddard's environmental and engineering test facilities to get a sneak preview of the Center's upcoming missions.

The tour started at the second-floor gallery, outside the High Bay Clean Room, current residence of components that will be installed on the *Hubble Space Telescope* as part of Servicing Mission 4.



Photo credit: Bill Hrybk

Caption: George Takei (second from left) receives a briefing on Goddard's role in Hubble Servicing Mission 4 from Mike Adams, Development Manager for Carriers (left), and Kevin Boyce, System Lead for the Advanced Camera for Surveys repair (second from right). Takei's partner, Brad Altman (right), looks on.

Mike Adams, *Hubble's* Carriers Development Manager, and Dr. Kevin Boyce, the System Lead for the repair of the Advanced Camera for Surveys, briefed Takei and Altman on what role Goddard's clean room plays. The High Bay Clean Room houses exact replicas of *Hubble* sections, which makes it the perfect place to test new telescope components prior to launch.

Next stop was the Acoustic Test Chamber to see the *Solar Dynamics Observatory* (SDO). SDO will observe the weather of the Sun to study its effects on Earth. The Acoustic Test Chamber can blast a payload with 150 decibels of sound, which is about the level you would hear standing next to a jet engine during takeoff. A rocket can create a lot of noise when it goes up; making sure a satellite can withstand the racket is an important step in preparing for launch.

Glenn Bock, a test conductor for SDO, pointed out some of the satellite's key components on a nearby actual-size model. To make sure SDO always points in the correct direction, he said, it will make use of devices called Star Trackers.

"Not Trekkers?" Takei jokingly asked.

Bock chuckled and said he would see what he could do about changing the name. "I was floored by his energy and interest in what we do," Bock said later. "Lots of us grew up with 'Star Trek,' it's in our minds when we're doing all this."

Just a few paces away from the Acoustic Test Chamber is another clean room, the temporary home of the *Lunar Reconnaissance Orbiter* (LRO). LRO is the first mission in NASA's planned return to the Moon. Among its objectives is to find possible landing sites for future manned missions.

Takei and Altman spoke with LRO Project Manager Craig Tooley and Deputy LRO Project Manager Catherine Peddie while technicians, fully garbed in clean room "bunny suits," took short breaks from their work to take pictures and issue Takei the 'Star Trek' trademark "live long and prosper" salute.

"It's such a thrill to be here with you folks at NASA, because you're the real pioneers of our time," Takei said of the Goddard experience. "So many people here told us that they watched 'Star Trek' as a student in college or in high school, and that's what inspired [them] to go into this. But you guys are the inspiration for us. You truly are our heroes of the 21st century."

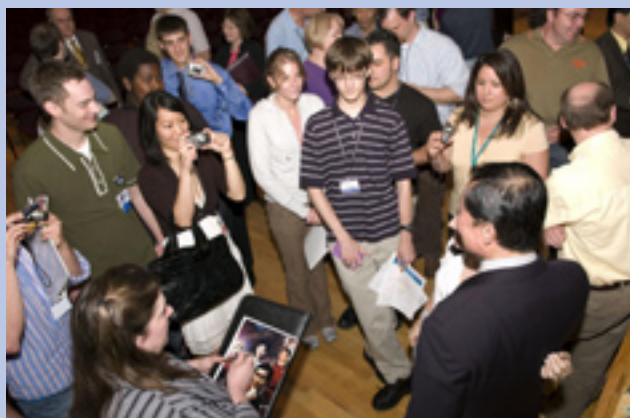


Photo credit: Bill Hrybk

Caption: George Takei mingles with Goddard fans.

Takei's visit was the latest in a long list by actors from the "Star Trek" franchise. Other recent Starfleet visitors who have received warm welcomes at Goddard include Connor Trinneer, who played Chief Engineer "Trip" Tucker on "Star Trek: Enterprise," and Jeri Ryan, who played Seven of Nine on "Star Trek: Voyager." ■

Spreading the Word about Goddard's Research in Climate Change

By Lynn Chandler

Thirty environmental journalists spent the afternoon of May 29 at Goddard Space Flight Center in Greenbelt, Md., to learn about the latest research in climate change. Dr. David Adamec, head of the Ocean Sciences Branch, Code 614.2, spoke on the role the ocean plays in climate and life on Earth. Dr. Waleed Abdalati, a glaciologist in Code 614.1, presented Goddard's research on the Earth's polar ice cover using satellite and airborne instruments. Both Adamec and Abdalati used the resources of the Scientific Visualization Studio to tell their story about Goddard's research in climate change.



Caption: Environmental journalists takes notes during the climate change seminar.

The reporters were from across the country and represented radio, newspaper, internet, and television outlets. The group was part of the Knight Center for Specialized Journalism, a part of the University of Maryland's School of Journalism. The Knight Center is a national program offering free seminars for print, broadcast, and online reporters, editors, and editorial writers. This particular program was entitled "Climate Change—Its Sweeping Impact."

This seminar served as an opportunity for Goddard to have a group of experienced journalists learn about our important research in climate change from some of our senior scientists. The research that was presented will have a lasting impact, providing the Knight Fellows with new sources, valuable reference materials, and many new story ideas. It is anticipated that this visit will result in more media coverage from many new and diverse media outlets. Some of the reporters were so intrigued by the presentations that they started on their stories right away.

Before coming to Goddard, this particular Knight Center group spent four days at the University of Maryland—College Park learning about impacts of climate change from many experts, including the Associate Director of the Harvard Medical School Center for Health and the Global Environment, an associate professor of environmental ethics, science, and law from the Pennsylvania State University, and the Maryland State Secretary of the Environment.

As part of the 4-day seminar, two Goddard senior scientists traveled to the University of Maryland to share their work and research. Dr. Robert Cahalan, head of the Climate and Radiation Branch, Code 613.2, presented his research on climate and cloud structure. Dr. Cynthia Rosenzweig, senior scientist at NASA's Goddard Institute for Space Studies, Code 611, shared her work on assessing the potential impacts of global environmental change.

It is vital to Goddard's continuing mission that the public know what the scientists here at Goddard are learning from our research, and these journalists can make a difference by writing about our work in climate research. It is also important that the public engage in broad discourse about the planet on which we live. The presentations to the Knight Program participants will go a long way toward advancing that discourse. Earth science is an important part of what NASA does. This climate change seminar is an aid to the public's growing knowledge of NASA's major contributions to understanding our planet. Be on the look out for new stories in the media about Goddard's work in the area of climate change.

For more information about the Knight Center for Specialized Journalism, visit: <http://www.knightcenter.umd.edu>. ■



Caption: Dr. David Adamec addresses environmental journalists.

Gamma-ray Large Area Space Telescope (GLAST) Launches Successfully

By Trusilla Steele

Hundreds of Goddard employees, some with family members, gathered in the Building 8 auditorium on Wednesday, June 11 to witness the launch of the *Gamma-ray Large Area Space Telescope* (GLAST). Before the launch, employees enjoyed refreshments sponsored by the NASA Federal Credit Union.



Caption: It was standing room only at the GLAST launch viewing.

Chief Scientist Dr. James Garvin opened the event with an overview of the mission and spacecraft. Some of the fascination associated with the GLAST mission is that it will reveal some unknowns about black holes, dark matter, gamma ray bursts, solar flares, and Weak Interacting Massive Particles (WIMP). Garvin recognized GLAST as being a "great voyage of discovery in physics." Garvin then gave an overview of the spacecraft's instruments.



Caption: Jim Garvin discusses the Gamma-ray Large Area Space Telescope (GLAST) with a packed Building 8 auditorium.

GLAST has two instruments: the Large Area Telescope (LAT) and the GLAST Burst Monitor (GBM). The LAT detects gamma rays by using Einstein's famous $E=mc^2$ equation in a technique known as "pair production." When a gamma ray, which is pure energy, slams into a layer of tungsten in the detector, it creates a pair of subatomic particles (an electron and its antimatter counterpart, a positron). The incoming gamma ray's



Caption: Kris Brown, Jim Garvin, and other Goddard employees watch the successful launch of GLAST onboard a Delta II rocket.

direction is determined by projecting the direction of these particles back to their source. The GBM is sensitive to X-rays and gamma rays with energies between 8 keV (Kilo Electron Volts) and 30 MeV (Mega Electron Volts). The GBM has an even larger field of view than the LAT. The GBM can see all directions at once, except for the area where Earth blocks its view. When the GBM detects a bright gamma-ray burst, it immediately sends a signal to the LAT to observe that area of the sky. GLAST can see the entire sky in three hours.

Outside of Goddard, the GLAST launch received worldwide attention from all the news wire services: Agence-France Presse, Associated Press, Reuters, and United Press International. Television stations across the country carried the video, fed by Reuters Wire Video. A June 12th Google search revealed 428 stories worldwide.

After an extended hold and some radar issues, and under the threat of rain, the anxious crowd watched GLAST lift off successfully onboard a Delta II "Heavy" rocket at 12:05 p.m. For more information on GLAST, visit: <http://www.nasa.gov/glast>. ■



Caption: We have liftoff.

Goddard Technologists Win \$11.2 Million to Continue Instrument Concepts

By Lori Keesey

Four Goddard technologists have won nearly \$11.2 million in NASA Headquarters funding to continue work on new Earth-observing instruments aimed at gathering measurements needed to understand global climate change.

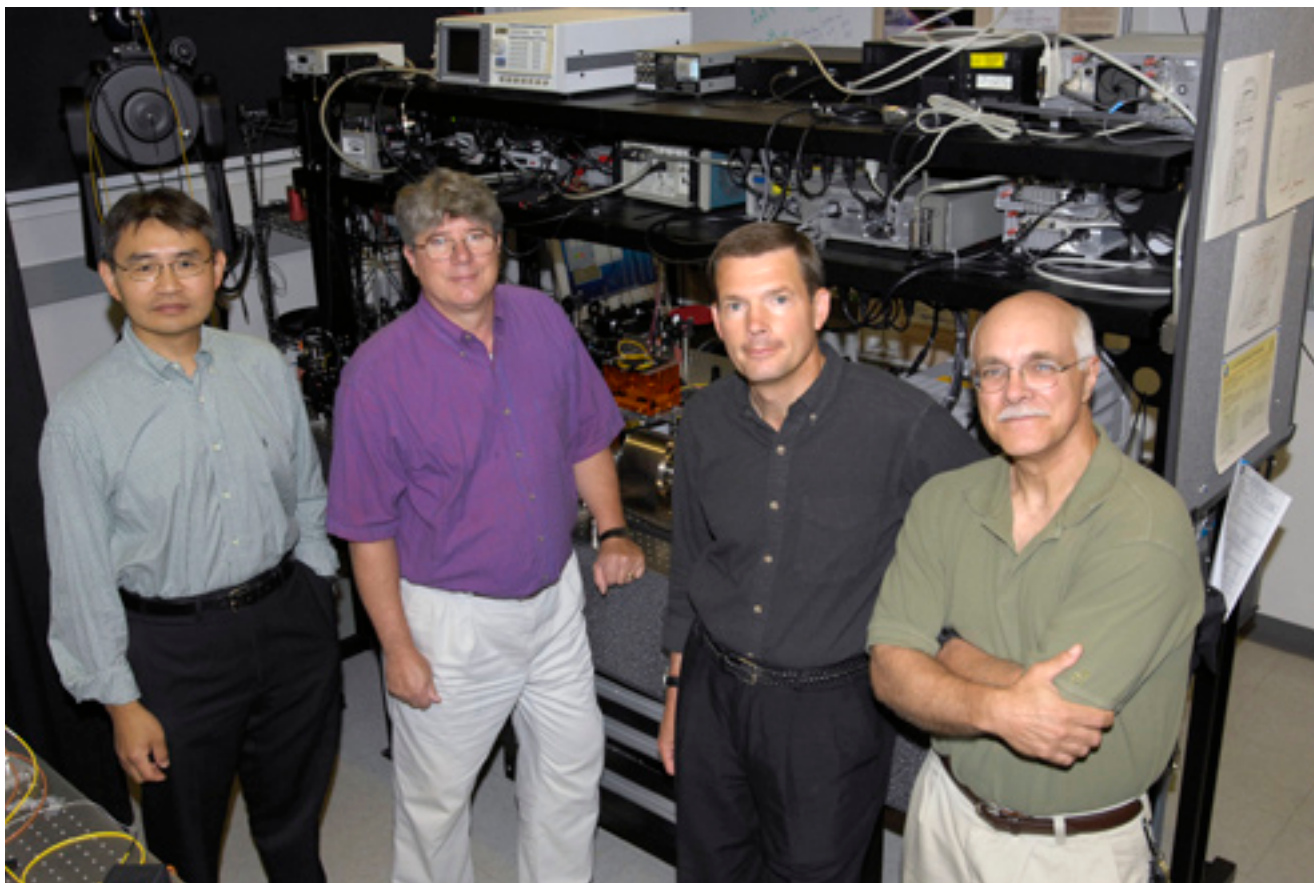
The NASA Science Mission Directorate selected James Abshire, Anthony Yu, Charles McClain, and William Heaps to receive funding under a 3-year Instrument Incubator Program (IIP) award. All four had received Goddard Internal Research and Development (IRAD) funds to initially begin work on their concepts. "If we didn't have IRAD, I don't think we could have put together this proposal," McClain said after learning of his IIP award. "It was pretty critical."

The instruments address a variety of problems. Abshire and Heaps are developing different laser techniques for measuring carbon dioxide—a leading greenhouse gas—in the atmosphere. Yu is developing a swath-mapping space altimeter to gather topographic and vegetation measurements. McClain is developing a next-generation ocean radiometer that would measure marine photosynthesis, which is vital to the carbon cycle and the ocean food chain.

All the instruments respond to needs outlined by the National Academy of Sciences in its first-ever decadal survey of Earth-observing missions. The report, which the Academy released in 2007, urged NASA to rebuild its aging network of environmental spacecraft by funding 15 Earth-observing missions between 2010 and 2020.

McClain's ocean color radiometer—the Ocean Radiometer for Carbon Assessment (ORCA)—is a candidate for the recommended Aerosol, Cloud, and Ecology (ACE) mission. Yu's swath-mapping laser altimeter would meet the goals of the proposed Lidar Surface Topography (LIST) mission. Both concepts for measuring carbon dioxide would meet recommendations that NASA fly a lidar instrument to discover and quantify unknown sources and sinks of this greenhouse gas.

The IIP program is designed to reduce the risk of innovative instrument systems that are needed for future science missions. Under this solicitation, the Science Mission Directorate received 71 proposals and selected 21 for a total of \$64 million. During the 3-year program, the technologists plan to fine-tune their instrument concepts and ultimately test their devices from an aircraft platform. The aim is to reach a technology readiness level of six. ■

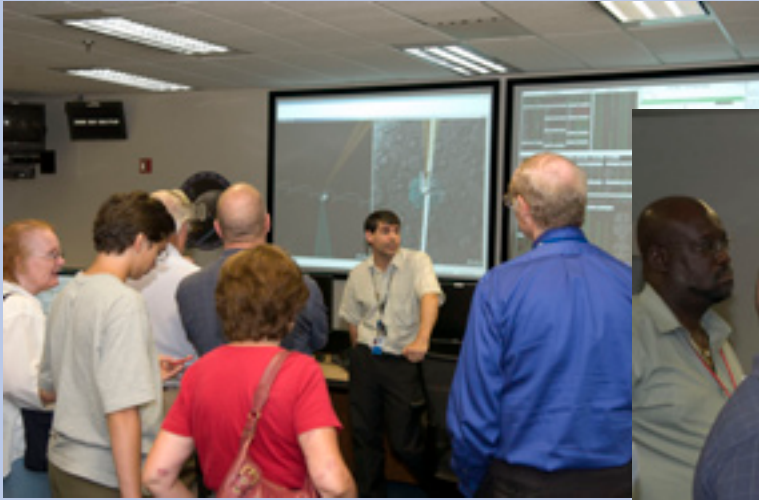


Caption: Anthony Yu, William Heaps, James Abshire, and Charles McClain.

Photo Credit: Debora McCallum

Family and Friends Tour the *Lunar Reconnaissance Orbiter* (LRO) During LRO Goddard Employee and Family Day

Photos By Bill Hrybyk



Innovators Recognized for New Technology Reporting

By Nicole Quenelle

Hosted by Goddard's Innovative Partnerships Program (IPP) Office, the 16th Annual New Technology Reporting (NTR) Program was held May 14 at the Newton White Mansion in Mitchellville, Md. Attendees included Goddard innovators, partners, and managers who gathered to recognize the technology transfer achievements of their peers, and to learn how new technology reporting results in successful technology transfer collaborations or partnerships.



Caption: Attendees fill the Newton White Mansion for the 2008 New Technology Reporting (NTR) Program.

"We're here today to celebrate and learn from the success that can be achieved through New Technology Reporting," said IPP Office Chief Nona Cheeks. "This, of course, is critical to launching our technology transfer activities, which can benefit Goddard, NASA, yourselves, and the taxpayers."

Dennis Andrucyk, Deputy Director of Engineering, emphasized the importance of filing new technology reports, both for patent protection and to demonstrate Goddard's technical capabilities. Andrucyk encouraged innovators to make reporting NTRs a priority to strengthen and protect the value of Goddard's innovations.

Andrew Petro, Program Executive for IPP's Innovation Incubator, echoed Andrucyk's remarks. Petro highlighted how the IPP helps to increase Goddard's value through technology infusion, innovation incubation, and partnership development.

Tony Maturo, Deputy Director of NASA's Academy of Program and Project Leadership, also presented data showing the increase in Goddard's value as seen through significant growth in Inventions and Contributions Board (ICB) Awards. By May 2008, Goddard expected more than \$104,000 in ICB awards, Maturo said—more than double the amount awarded by this time last year. NASA Chief Engineer Mike Ryschewitsch also offered a few words of congratulations for an impressive and substantial success in ICB awards during the last year.

Keynote Presenter Focuses on Technology Transfer Success

President of designAmerica and keynote speaker Tom Green provided the audience with an excellent example of the growing value of Goddard technologies by highlighting the ongoing successful relationship between Goddard and his company.

During the 1990s, designAmerica participated with Goddard in the development of the Advanced System for Integration and Spacecraft Test (ASIST) technology—a real-time command-and-control system for spacecraft development, integration, and operations. The company licensed ASIST from Goddard in October 2003, making it available as a commercial off-the-shelf (COTS) product. Today, ASIST has become the ground system of choice for successful satellite and instrument projects and has significantly contributed to the small company's growth.

Green pointed out the value of this technology transfer success for small companies like his, "It is a tough job to brew up tech transfer success from that big cauldron called technological innovation. It takes keen insight and prescience, more than a little wisdom, and perhaps even a little helpful buffering from time to time for small companies like mine."

Technology Transfer Efforts Win Award

During the program, Dr. Stephanie Getty's dedication to technology transfer efforts and new technology reporting were recognized as she received the prestigious James Kerley Award. Named for an innovator and teacher with a 32-year tenure at Goddard, the award is given annually to an innovator who exemplifies Kerley's commitment to technology transfer.



Caption: Rick Obenschain (right) presents Stephanie Getty with the Kerley Award.

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Innovators Recognized for New Technology Reporting

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"Dr. Stephanie Getty has shown a tireless commitment to technology transfer since she first joined us at Goddard about four years ago," said Goddard Acting Center Director Rick Obenschain, who presented Dr. Getty with the award. "She also helps to promote Goddard technologies to outside organizations."

In accepting her award, Dr. Getty commented on the importance of attending external events with support from the IPP Office. "I am grateful to the IPP Office for giving me the opportunity to participate in a wide variety of meetings, technology transfer forums, conferences, and workshops." Getty said the opportunities gave her insights into commercial opportunities for Goddard technologies.

Patent Recipients Honored

Goddard patent attorney Christopher Edwards honored the Goddard innovators who had technologies patented in the last year. The IPP Office congratulates the patent recipients: Richard Burns, Frank Cepollina, James Corbo, Jill Holz, Nicholas Jedhrich, John Vranish, John Degnan, Milton Davis, Eliezer Ahronovich, and Russell Roder.

Looking Ahead: Technology Transfer Training Emphasized

The primary message throughout the NTR Program was the importance of filing NTRs. "In the IPP Office, we're always here to help you find ways to apply Goddard technologies within and beyond NASA," said Nona Cheeks. "But, as you've heard, we really do need your help. This all starts with filing the NTR."

Cheeks encouraged attendees to learn more about the NTR submission process and its importance to technology transfer by attending the



Photo Credit: Bill Hydyk

Caption: Nona Cheeks welcomes attendees of the 2008 NTR Program.

Introduction to Technology Transfer training course. The course is offered on three upcoming dates: June 26, September 18, and December 2. All NASA civil servants and contractors are welcome and encouraged to attend. The course is held in Building 1, Room E100D. Civil servants can register online at <https://saturn.nasa.gov>. Contractors can register by contacting the IPP Office's Dale Hithon at 301-286-2691.

For more information about IPP's Innovation Incubator, visit: http://ipp.nasa.gov/innovation_incubator.htm. ■

Norman Mineta Visits Goddard

By Sharon Wong

Former Secretary of Transportation Norman Y. Mineta, the first Asian Pacific American to serve in a President's cabinet, visited Goddard as part of Asian Pacific American Heritage Month (APAHM) on Wednesday, May 14. Secretary Mineta's day started with a luncheon to recognize APAHM, during which he spoke on the theme of "Leadership, Diversity, Harmony—Gateway to Success."

The sold out luncheon began with opening remarks by Gerald Tiqui, the Asian Pacific American (APA) Program Manager, and a welcome from Acting Center Director Rick Obenschain. Sharon Wong, Special Assistant for Diversity, introduced Secretary Mineta, who praised the men and women of NASA as, "the spark to everyone's imagination, from the youngest boys and girls to folks like me who are approaching the outer limits of their middle age years."

He went on to say that NASA employees are "the space program and I want you to know that America is proud of you." Mineta stated that, "We can ensure that every person has not only an equal chance, but a much greater chance to pursue the American dream, and we must strive to ensure that all Americans have the opportunity to reach their full potential."

He further discussed finding ways to, "Break through stereotypes of Asian Pacific Americans" and that, "America's heritage is the heritage of all of the nations and all of the peoples whose sons and daughters have found hope and opportunity here—and whose descendants now form the fabric of America." Greetings were also provided by Nichelle Schoultz from Senator Barbara Mikulski's Office and David Lee, Executive Director on Asian Pacific American Affairs, from the Maryland Governor's Office.



Photo Credit: Bill Hydyk

Caption: Minetta learns about some upcoming Goddard missions.

After the luncheon, Secretary Mineta toured several Goddard facilities. He visited the Spacecraft Test and Integration Facilities, including the *Solar Dynamics Observatory* (SDO), and the *Lunar Reconnaissance Orbiter* (LRO), with briefings by SDO Project Manager Liz Citrin, LRO Deputy Project Manager Cathy Peddie, and Edward Packard. The tour continued to the Spacecraft Systems Development and Integration Facility where Dr. Frank Cepollina provided a tour of the High Bay Clean Room and the *Hubble Space Telescope* mock-up. ■

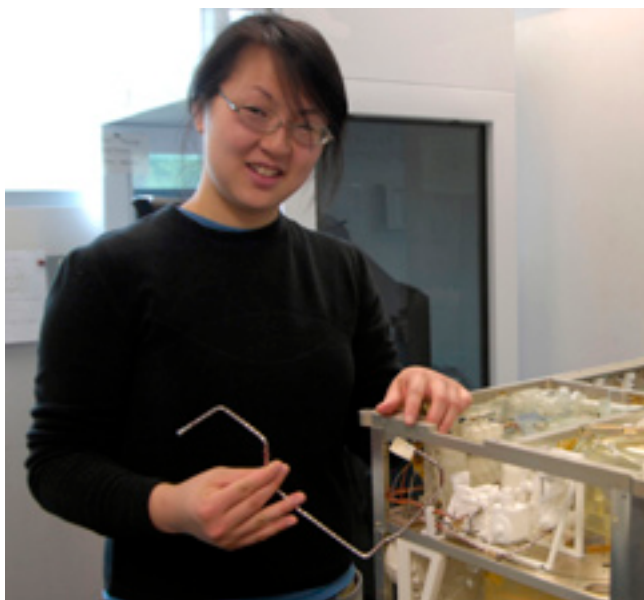
Young “Plumber” Bends Pipes for Mars Mission

By Cynthia O’Carroll

When Synthia Tonn was earning her aeronautics and astronautics degree from the Massachusetts Institute of Technology, working as a plumber for NASA never entered her mind. She works on what is affectionately called the “plumbing system,” which is a very intricate system of small diameter gas processing lines on NASA’s Sample Analysis at Mars (SAM) instrument suite. SAM is the essential laboratory that will head to Mars aboard the *Mars Science Laboratory* (MSL) in the fall of 2009.

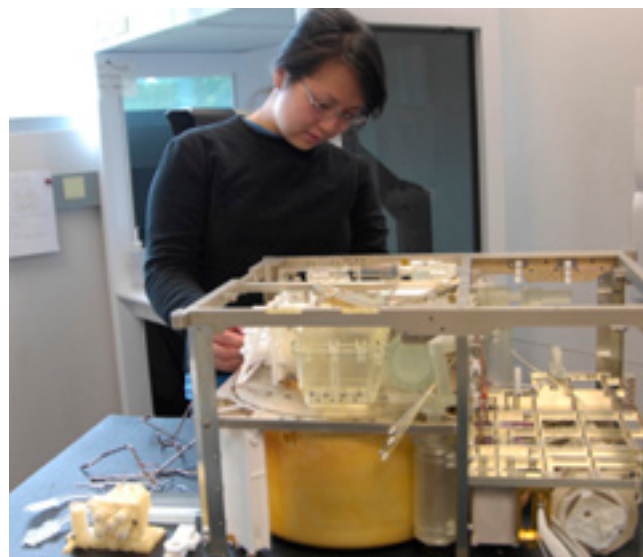
Once work on Mars begins, soil samples will be dropped into the Solid Sample Inlet Tube and will be vaporized, or pyrolyzed by high heat, into gas. Tonn implemented the pathway that the narrow gas processing lines travel. A useful analogy for the gas processing system is a subway system, where sample passengers are transported along a closed path to each predetermined component station for analysis or other scientific activity. This pipeline system is essential for finding the chemical signatures of organic compounds to determine if life was ever possible on Mars.

Tonn bent many of the nickel and stainless pipes by hand, laying out the turns and twists needed to carry gas samples to the Quadrupole Mass Spectrometer (QMS) onboard SAM for testing. SAM will also be packing its own gas for the trip to Mars—a burst of helium will be added to each gas sample to help propel it through the tiny tubes to manifolds and components for analysis.



Caption: Synthia Tonn and one of many pipes she bent by hand.

Tonn also used her knowledge of the suite configuration to spatially lay out the physical location of thermal and electrical components for SAM, and helped coordinate the initial technical installation of thermal heaters and electrical components on the pipeline. Her work on the plumbing system has involved a great deal of interfacing with the mechanical, electrical, thermal, and instrument teams.



Caption: Synthia Tonn at work.

At 23 years old, Tonn is fun-loving, artistic, and creative, and she finds the atmosphere at Goddard very welcoming. “My coworkers are such knowledgeable, supportive, and all-around interesting people, which makes the work environment enjoyable,” stated Tonn.

Tonn came to Goddard as a co-operative education student in 2005, and was a mentor for the Eleanor Roosevelt High School For Inspiration and Recognition of Science and Technology (FIRST) robotics team when they won the regional championship.

She often enjoyed using her engineering skills and imagination in college, helping friends build projects such as a rotating seesaw on their dormitory lawn. She was the house manager of a student co-op house during college, where the residents ran and maintained the house themselves. This often included tasks such as overseeing the installation of a natural gas boiler, re-bricking the driveway, tiling the entire kitchen and pantry floor, and hanging doors for their bike shed. Tonn is passionate about the outdoors and loves to cycle, once biking along the Pacific Coast from Vancouver, British Columbia to San Luis Obispo, Calif.

The SAM instrument suite is being assembled at NASA’s Goddard Space Flight Center. Paul Mahaffy is the Principal Investigator for SAM and is also the Chief of Goddard’s Atmospheric Experiment Laboratory.

Led by NASA’s Jet Propulsion Laboratory, Pasadena, Calif., MSL is the next step in NASA’s Mars Exploration Program, a long-term effort of robotic exploration of the Red Planet. The MSL rover will comb the surface of the planet looking for clues that Mars once supported microbial life and may still today.

For information about SAM, visit: <http://ael.gsfc.nasa.gov/marsSAM.shtml>.

For information about MSL, visit: <http://mars.jpl.nasa.gov/msl>. ■

Goddard Scientists Receive Lindsay Award for Black Hole Research

By Robert Naeye and Rob Gutro



Photo Credit: Pat Izzo

Caption: Dr. John G. Baker.

Dr. John G. Baker and Dr. Joan M. Centrella are the 2008 recipients of the John C. Lindsay Memorial Award for Space Science. NASA's Goddard Space Flight Center in Greenbelt, Md., honors one or more of its civil servant space scientists each year with this award, which is the Center's highest honor for outstanding contributions in space science.

Black hole mergers are by far the most powerful events in the universe since the Big Bang. Supermassive black holes reside in the centers of most or all large galaxies, so black hole mergers have played a pivotal role in the construction of galaxies. Understanding these collisions is essential to understanding cosmic evolution.

The Goddard group's advances have spurred rapid progress in predicting the observable signatures of these events. Scientists will search for these signatures with sensitive instruments for measuring gravitational waves, such as the National Science Foundation's Laser Interferometer Gravitational-wave Observatory (LIGO), and the space-based Laser Interferometer Space Antenna (LISA), a planned mission of NASA and the European Space Agency. The new calculations impact astronomy in other ways as well, showing that the black hole that results from a merger can receive an enormous kick, which can eject it from a host galaxy.



Photo Credit: Pat Izzo

Caption: Dr. Joan M. Centrella.

Centrella and Baker received their awards on May 30 for their groundbreaking computer simulations, which show what happens when two supermassive black holes collide and merge. Centrella serves as Director of Goddard's Gravitational Astrophysics Laboratory. Baker is an astrophysicist with the Numerical Relativistic Astrophysics Group.

"Theoretical work is rarely honored by the Lindsay Award; most of the awards are presented for observational discoveries made with new NASA missions," notes William Oegerle, director of Goddard's Astrophysics Science Division. "The work by Centrella and Baker is of special importance to NASA, since it is a driving force for the design of the Laser Interferometer Space Antenna, a mission which will detect the gravitational waves from black hole mergers."

Centrella and Baker cite the vital contributions of team member Jim Van Meter, who played a leading role in these advances.

Centrella grew up in Winsted, Conn. She completed undergraduate coursework at the University of Massachusetts at Amherst. Her doctoral degree is from Cambridge University, United Kingdom. She came to Goddard in 2001.

Baker hails from Kansas City, Mo. He completed his undergraduate work at Northeast Missouri State University (now Truman State University) in Kirksville, Mo., and received his doctorate from the Pennsylvania State University in 1999. He also moved to Goddard in 2001. Both Baker and Centrella reside in Silver Spring, Md.

Last year, Centrella received the NASA Exceptional Scientific Achievement Medal. The NASA Administrator awards the medal each year for significant accomplishments that contribute to the Agency.

The Lindsay Award commemorates the 1962 launch of the first of eight Orbiting Solar Observatories, which was built by John Lindsay and others.



"We have an outstanding team of both civil servants and contractors," adds Baker. "The Lindsay Award recognizes the contributions of everyone in our group."

According to Albert Einstein's general theory of relativity, when two black holes merge, the surrounding space trembles like an earthquake as gravitational waves race outward at light speed. For 30 years, attempts to simulate these dramatic collisions on computers failed because of the complexity of the mathematics, which caused computers to crash. The Goddard team, however, developed a method to translate Einstein's equations into a form that computers can handle. Teams around the world are now using the techniques developed by the Goddard group.

New Faces:

A monthly feature spotlighting new members of the Goddard community.

By John Putman



Photo provided by Dr. Roberge

Caption: Aki Roberge.

Aki Roberge is an Astrophysicist in Code 667. She studies planet-forming disks around neighboring young stars.

Born in Japan, Aki grew up in the small village of East Topsham, Vt., which consisted of a few farms and about 30 homes. Throughout her childhood, Aki knew she wanted to be a scientist, with no particular specialty in mind.

Aki received her bachelor's degree in physics from the Massachusetts Institute of Technology in 1996, and a Ph.D. in astrophysics from the Johns Hopkins University in Baltimore, Md., in 2003. After a postdoctorate fellowship at the Carnegie Institution for Science in Washington, D.C., Aki received a fellowship at Goddard in 2005. She successfully transitioned just last month to a civil servant position after an eight month application process.

Part of what brought Aki to Goddard, and NASA in general, is her preference for, "public outreach over formal classroom teaching." Aki considers Goddard to be a, "very stimulating place to work." Because most projects undertaken at Goddard are too big for one person, the environment is "inherently collaborative." Aki likes that, "it's so easy to get involved with diverse activities."

Aki's time outside of work is spent discussing astronomy with her husband, also an astronomer, and reading science fiction and history. Aki and her husband also enjoy gardening and gourmet cooking. ■



Photo credit: Debora McCallum

Caption: Lakeshia Rawlings.

Lakeshia Rawlings is a Contract Specialist in Code 210.4.

She came to NASA from Booz Allen Hamilton with a master's degree in Human Resource Management.

Lakeshia came to Goddard because she has "always been fascinated with NASA's plans for space and planetary habitation and exploration, and wanted to be a part of that experience."

Working at Goddard has provided Lakeshia with the, "opportunity to become part of a great team of people."

When not at work, Lakeshia enjoys spending time with her family. ■